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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/762,479	01/23/2004	Seok-Soon Kim	28946U	4940
20529 7590 12/31/2008 THE NATH LAW GROUP 112 South West Street Alexandria, VA 22314				
EXAMINER				
MOWLA, GOLAM				
ART UNIT		PAPER NUMBER		
1795				
MAIL DATE		DELIVERY MODE		
12/31/2008		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/762,479

**Applicant(s)**

KIM ET AL.

**Examiner**

GOLAM MOWLA

**Art Unit**

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 10 October 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1, 2 and 4 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 2 and 4 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/CDC)
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date: \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_
- Paper No(s)/Mail Date: \_\_\_\_\_

## **DETAILED ACTION**

### ***Response to Amendment***

1. Applicant's amendment of 10/10/2008 does not place the Application in condition for allowance.
2. Claims 1, 2 and 4 are pending. Applicant has amended claim 1 and cancelled claims 3 and 5-14.

### ***Status of the Rejections***

3. The rejections of claims 1, 2 and 4 from the office Action mailed on 05/12/2008 are withdrawn in view of Applicant's arguments that the prior art fails to teach each and every elements that is claimed. However, upon consideration a new ground(s) of rejection under 35 U.S.C. 103 is presented below.

### ***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 1, 2 and 4 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which

was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. In lines 5-6 of claim 1, Applicant recites that the metal oxide is amorphous. One of ordinary skill in the art would have realized that the meaning of amorphous is having no definite shape or structure. However, in lines 9-10 of claim 1, Applicant recites that "the metal oxide comprises a metal having an open structure and wherein the metal oxide is selected from oxides of tantalum, silicon, titanium, and nickel." It is not enabling to one of ordinary skill in the art as to how a metal oxide can be amorphous and have open structure at the same time. Even the Applicant discloses in [0011] of the specification that the metal oxides have to be crystalline in order to have open structure. Applicant is asked to clarify.

7. Claims 1, 2 and 4 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1, 2 and 4 are indefinite because in lines 5-6 of claim 1, Applicant recites that the metal oxide is amorphous. One of ordinary skill in the art would have realized that the meaning of amorphous is having no definite shape or structure. However, in lines 9-10 of claim 1, Applicant recites that "the metal oxide comprises a metal having an open structure and wherein the metal oxide is selected from oxides of tantalum, silicon, titanium, and nickel." It is not clear to one of ordinary skill in the art as to how a metal oxide can be amorphous and have open structure at the same time. Even the

Applicant discloses in [0011] of the specification that the metal oxides have to be crystalline in order have open structure. Applicant is asked to clarify.

Claims 1, 2 and 4 are also indefinite because the term "open-structured transition metal" refers to a type of metal, and therefore, cannot limit the type of metal oxide as specified in the claim. In order to examine the claim on its merits, the limitation has been interpreted as meaning that the metal oxide created by the method specified in claim 1 is to have an open or porous structure.

***Claim Rejections - 35 USC § 103***

8. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
9. Claims 1, 2 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mahe et al. ("Electrochemical behavior of platinum-coated Ta/Ta<sub>2</sub>O<sub>5</sub> electrodes") in view of Park et al. ("Pt-WO<sub>x</sub> electrode structure for thin-film fuel cells," cited in previous office action).

Mahe discloses a method for fabricating a counter electrode for a dye-sensitized solar cell, the method comprising sputter depositing platinum and a tantalum oxide as target material onto a substrate (Ta substrate) (2:10 to 3: 19) and forming a counter electrode including platinum and tantalum oxide on a substrate (see Experimental section). The reference is silent as to the co-sputtering of the platinum and tantalum oxide, and also as to whether the platinum is nanocrystalline and tantalum oxide is amorphous forming a non-layered structure.

Park disclose a method for fabricating a counter electrode (Pt-WO<sub>x</sub> two-phase electrode, paragraph 2) the method comprising: co-sputtering platinum (Pt target material, paragraph 3) and a metal oxide (WO<sub>3</sub> target material, paragraph 3) as target materials onto a substrate (ITO coated transparent glass substrate, paragraph 3) as described in paragraph 3. The process forms a counter electrode (Pt-WO<sub>x</sub> nanostructured alloy electrode, paragraph 2) that includes nanocrystalline platinum (nanosized Pt crystalline phase of 4-5 nm shown as the dark portions of the images in Figure 1 and discussed in paragraph 4). Finally, the method disclosed by Park et al. yields an amorphous metal oxide (amorphous, porous tungsten oxidative phase discussed in paragraph 4 and shown as the "relatively bright region" in the TEM image of the electrode in Figure 1). Park et al. explain, in paragraph 1, that such a co-sputtering process produces electrodes "physical and electrochemical properties" that are superior relative to other techniques.

It would have been obvious to one of ordinary skill in the art at the time of the invention to have used the method steps of Park in the the method of Mahe to create a Ta<sub>2</sub>O<sub>5</sub>/Pt electrode, because such method allows to improve the physical and electrochemical properties of the electrode.

Examiner also notes that the preamble of the instant claim has not been given any patentable weight as it merely recites the purpose of the process and the intended use of the resulting structure, while the body of the claim does not depend on the preamble for completeness and the process steps and structural limitations are able to stand alone (see MPEP 2112.02).

Regarding claims 2 and 4, the tantalum oxide has a refractive index of 2 or higher and an electric conductivity of 0.1 S/m or more. Examiner notes that "claiming of a new use, new function or unknown property which is inherently present in the prior art does not necessarily make the claim patentable." See MPEP §2112. See also *In re Best*, 562 F.2d 1252, 1254, 195 USPQ 430, 433 (CCPA 1977).

### ***Response to Arguments***

10. Applicant's arguments with respect to claims 1, 2 and 4 have been considered but are moot in view of the new ground(s) of rejection as necessitated by the amendments.

Applicant argues that "teaching of Park does not anticipate the above-recited claim feature because the reference merely discloses an electrode including "Pt metal" and an amorphous metal oxide including "tungsten" while, according to the claimed subject matter, the metal oxide must be selected from oxides of tantalum, silicon, titanium, and nickel. Since Park discloses, teaches, or suggests none of these four metal oxides, the reference fails to disclose all of the claim features" (see Remarks, page 3).

This argument is persuasive and is moot in view of new ground of rejection as presented above.

***Correspondence/Contact Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GOLAM MOWLA whose telephone number is (571) 270-5268. The examiner can normally be reached on M-F, 0900-1700 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, ALEXA NECKEL can be reached on (571) 272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/G. M./  
Examiner, Art Unit 1795

/Alexa D. Neckel/  
Supervisory Patent Examiner, Art Unit 1795



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